

WHAT IS CLAIMED IS:

1. A reinforcing fiber comprised of at least two filaments bonded together and the filaments being comprised of a polymeric core, at least partially
5 enveloped by a polymeric sheath, comprised of a fusing-fraying polymer that has a lower melting temperature than the polymer core, such that the reinforcing fiber, when mixed with inorganic particulates, frays predominately only at an end or ends of the fiber.
- 10 2. The reinforcing fiber of Claim 1 wherein at least about 60 percent of the reinforcing fibers fray only at the ends when mixed with concrete and water.
3. The reinforcing fiber of Claim 2 wherein the mixing time is at least about 5 minutes to at most
15 about 20 minutes.
4. The reinforcing fiber of Claim 1 wherein the core polymer is polypropylene having a melt flow rate from about 4 to about 20.
5. The reinforcing fiber of Claim 4 wherein
20 the core polymer is polypropylene having a melt flow rate of from about 8 to about 16.
6. The reinforcing fiber of Claim 1 wherein the fusing-fraying polymer is low density polyethylene, ethylene styrene copolymer, low density polyethylene
25 grafted with maleic anhydride, maleic anhydride-grafted polypropylene, ethylene acrylic acid copolymer, ethylene-methacrylic acid or combinations thereof.
7. The reinforcing fiber of Claim 5 wherein
30 the fusing-fraying polymer is ethylene acrylic acid copolymer or ethylene styrene copolymer.

8. The reinforcing fiber of Claim 6 wherein the FF polymer is polyethylene having a melt index from about 5 to about 35 and a density of from about 0.9 gram per cc to about 0.965 gram per cc or combinations thereof.

5 9. The reinforcing fiber of Claim 1 wherein the sheath contains a mechanical activator polymer.

10 10. The reinforcing fiber of Claim 9 wherein the mechanical activator polymer is nylon, polyvinylalcohol, thermoplastic hydroxy-functionalized polyether or polyester or combinations thereof.

15 11. A reinforcing fiber comprised of a polypropylene core polymer at least partially enveloped by a sheath comprised of a fusing/fraying polymer that has a lower melting temperature than the polypropylene core and is selected from the group consisting of low density polyethylene, maleic anhydride grafted low density polyethylene, ethylene-styrene copolymer, polyethylene having a melt index from about 5 to about 35 and a density of from about 0.9 gram per cc to about 0.965 gram per cc, 20 ethylene acrylic acid copolymer and combinations thereof.

12. The reinforcing fiber of Claim 11 wherein the fusing/fraying polymer is the ethylene acrylic acid copolymer.

25 13. A concrete article comprised of concrete having therein a reinforcing fiber, where at least about 50 percent of the reinforcing fibers are frayed at an end or ends of the reinforcing fibers.

14. A concrete article comprised of concrete having therein the reinforcing fiber of Claim 1 wherein at

least 60 percent of the reinforcing fibers are frayed at an end or ends of the reinforcing fibers.

15. A concrete article comprised of concrete having therein a reinforcing fiber of Claim 11 wherein at least about 50 percent of the reinforcing fibers are frayed only at an end or ends of the reinforcing fibers.

16. The concrete article of Claim 13 wherein at least about 60 percent of the reinforcing fibers are frayed only at an end or ends of the reinforcing fibers.

10 17. The concrete article of Claim 16 wherein at least about 75 percent of the reinforcing fibers are frayed only at an end or ends of the reinforcing fibers.

18. The concrete article of Claim 15 wherein at least about 75 percent of the reinforcing fibers are frayed only at an end or ends of the reinforcing fibers.

19. A method for preparing a concrete article comprised of mixing concrete, water and a reinforcing fiber for a sufficient time to fray an end or ends of at least 50 percent of the reinforcing fibers and curing the mixture to form the concrete article.

20. The method for preparing concrete of Claim 19 wherein the reinforcing fiber is comprised of at least two filaments bonded together and comprised of a polymeric core, at least partially enveloped by a polymeric sheath comprised of a fusing-fraying polymer that has a lower melting temperature than the polymeric core, such that the reinforcing fiber, when mixed with the concrete, frays predominately only at an end or ends of the fiber.

21. The method for preparing concrete of Claim 20 wherein the reinforcing fiber is comprised of a

polypropylene core polymer, at least partially enveloped by a sheath comprised of a fusing/fraying polymer, selected from the group consisting of low density polyethylene, maleic anhydride grafted low density polyethylene, ethylene-styrene copolymer, polyethylene having a melt index of from about 5 to about 35 and a density of from about 0.9 gram per cc to about 0.965 gram per cc, ethylene acrylic copolymer and combinations thereof.

10 22. The method of Claim 21 wherein the reinforcing fiber is in a paper bag when added to the mix and the fibers completely disperse uniformly into the mix within about a mixing time of about 5 minutes.

15 23. The method of Claim 19 wherein the fibers, after mixing, have a surface area that is at most about ten times the surface of said fibers prior to mixing.

 24. The method of Claim 23 wherein the surface area, after mixing, is at least about 3 times the surface area prior to mixing.